THE MADRAS AGRICULTURAL JOURNAL

Vol. XXXIX OCTOBER 1952 No. 10

CONTENTS

Prize for Arecanut husking and slicing Machines.

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The Indian Central Arecanut Committee has decided to offer a prize of Rs. 2,000/- to any person or body who designs the best model of a time-saving and economic machinery for husking arecanut in all stages of maturity and capable of slicing the kernels and demonstrates its working to the satisfaction of the Committee or a competent body appointed by it.

Further details regarding the prize can be obtained from :

THE SECRETARY,
INDIAN CENTRAL ARECANUT COMMITTEE,
P. B. No. 14, KOZHIKODE - 1.

The Madras Agricultural Journal

Vol. XXXIX October 1952 No. 10

Editorial

The latest prevailing thought is about 'Community Project', launched throughout India as a new scheme to revitalise and improve the condition of villages and village life in India. It is but quite fitting that the scheme is inaugurated on the birth day of Mahatma Gandhi, whose ambition in life was reconstruction of villages.

In a comprehensive All-India three year plan, the scheme is to be worked mainly in villages. Our National Government has taken it up with the backing and inspiration from leaders and experts. The valuable technical and financial aid from the United States of America, is added strength. It is a gigantic co-operative endeavour to work up villages to high level of economic self sufficiency.

There are 55 project areas spread over the whole country for intensive development. Each area covers about 300 villages having a population of about 2 lakhs. In about five years there will be about 500 Projects and that means the entire rural area in India will be under this scheme. The six project areas in Madras State are in the Districts of Kurnool, Coimbatore, Malabar, East Godavari, South Kanara and Mathurai. A team of specially trained workers are at the task.

The main and immediate objective is increased food production. Efforts in this direction will include supply of quality seeds, implements, facilities for irrigation, adoption of improved methods of cultivation, fighting pests and diseases, practical guidance and help in preserving and marketing produce - all leading to maximisation of production and outturn. Cottage industries suited to the areas will be encouraged and fostered. Added to this, the scheme ultimately caters to all aspects of rural welfare, by improving literacy, sanitation, means of communications, cattle wealth etc. through organised efforts of self help in villages.

Apart from the high level of perfection in the matter of organisation and state aid, much lies in the hands of the villagers themselves and for maximum success, public co-operation is more essential here, than in any other sphere of activity.

This new scheme opens up a new era of Agricultural development and rural welfare in our country. Being a magnanimous effort to make village life happier, more attractive and lucrative, and having the inspiration from leaders, experts and the States alike, the scheme is bound to succeed, and incidentally may pave the way in the long run to stem the tide of exodus of people from rural areas to urban life.

The scheme is of special significance to the Departments of Agriculture in India, as it emphasizes agricultural extension service of a high order and magnitude, unprecedented in the near past.

Editor's Appeal

Articles and notes of interest on agricultural topics are welcome for publication in the Madras Agricultural Journal. All departmental officers and the public are requested to contribute suitable material with a view to enhance the utility of the journal.

Rose growing on the Nilgiris

By

V. SAMPATH,
(Sim's Park, Coonoor.)

Roses are largely grown in South India especially on the hill stations of the Nilgiris for pleasure as well as for profit. English roses, it is learnt were first introduced to the Nilgiris from England about the first quarter of the nineteenth century. Since then their spread on the hills has been rapid, with the result that every dwelling in the major areas of the hills has at least a couple of beautiful rose plants. From experience it has been found that among all places, the roses find a very congenial home in the Coonoor area, a place at an elevation of 5,500 feet to 6,000 feet in the Nilgiri Hill ranges.

Based mainly on the growth, habit, size, shape, colour and fragrance, the roses are distinctly grouped into definite types among which the more important types cultivated in South India are (1) Bourbon Roses, (2) Tea Roses, (3) Hybrid perpetuals, (4) Hybrid Tea Roses, (5) Noisette Roses, and (6) The Provence or Cabbage Roses.

1. **The Bourbon Roses:** These originate from the Isle of Bourbon and the common Edouard Rose which is the chief favourite of the plains belongs to this group. These are very hardy and vigorous growing types characterised by shiny rounded leaflets and profuse rose coloured blossoms, which are very fragrant and as a group most desirable for the constancy of their bloom as well as for their fragrance. These are easily propagated by layerings.

2. **The Tea Roses:** There deserve mention, not because they are so largely favoured in gardens, but because on them rests the Hybrid Tea Classess, which by far excels all others in present popularity. As a class these grow as tender bushes with branching and spreading habit producing larged sized flowers on lateral shoots characterised by thick petals in delicate shades of colour, and by the sweet smell akin to that emanating from a freshly opened tea chest. Though not continuous bloomers, these are free flowering. In the hill stations of South India the very popular varieties under this group are Lady Hillingdon, one of the few tea roses remaining in general cultivation and has long apricot yellow semi-double flowers borne on upright plants of moderate growth with unobtrusive bronze green foliage suitable for warm localities.

Jean Ducher, a free flowering hardy variety bearing pink flowers on slender shoots with handsome foliage. withstands severe winter frosts.

Maman Cochet, is a vigorous growing variety bearing double globular flowers which are light pink with the outer petals splashed with bright rose. (A good variety for exhibition purposes.)

3. **Hybrid Perpetuals:** Roses of this group are extensively cultivated in the Continent and England for their continuous blooming, rare combination of colours and delicate fragrance. To evolve this group, perpetually flowering varieties which flower fairly throughout the year, were hybridised with selected varieties for colour etc. These are distinguished by their stiff upright growths with dull green wrinkled foliage and rather large, many petalled flowers which are of dark colours. Generally speaking they yield fewer blooms in the late summer and autumn months and have been outstripped in garden value by the newer Hybrid Tea Roses, which flower for a much longer period. Notwithstanding this, hydbrid perpetuals elicit admiration, for they grow into strong vigorous bushes two feet or more in height with large handsome and generally fragrant blooms. In our country these behave as shy bloomers and are not popular, except on the hills.

Frau Karl Druschki, is one of the finest of all white roses, its high centred very double flowers being produced in profusion in April to June. Growth is vigorous and the plant has dark green mildew resistant foliage. Its only short coming is that it has no scent.

Hugh Dickson, is a vigorous grower with ample green foliage and fully double high centred flowers of good shape and intense crimson colour. The flowering is continuous and prolonged.

4. **Hybrid Tea Roses**: A group of roses much favoured by rosarians in India particularly on the hills for their multipurpose qualities. The massive size and gorgeous colour of the exhibition flowers, their utility as bedding roses for house decoration and button holes are unexcelled and thus there is not a single purpose demanded of the rose which the Hybrid Tea cannot supply. Flowers are more brilliantly coloured than in Tea Roses and are available in great diversity of colours. Cosidered as a class, these are the best for amateurs who can make a collection of several colours of them. These were created by crossing the Tea scented with the Hybrid perpetuals. These are characterised by and distinguished from the Hybrid perpetuals group by the deeper green foliage which are less wrinkled. Among this group the varieties mentioned below are best suited for the Hills.

General MacArther is an outstandingly good rose in shape as well as in colour. The deep scarlet flowers are fully double and are borne singly on short stems clad with deep green foliage.

Ophelia, is one of the best known of the all roses, and the parent of many exceptional varieties. The flowers are of perfect shape, double,

of pale salmon flesh, shaded with rose, and with an apricot centre, and are borne on long stiff stems. Growth is vigorous and erect with ample green foliage, which is sometimes susceptible to black spot.

Betty Uprichard, is a popular rose with large light green glossy foliage, strong growth, pointed buds, and large semi-double to double flowers of pale salmon pink with carmine reverse.

Shot Silk, is a moderately vigorous grower with erect branches and shining, glossy, deep green, mildew resistant foliage and bears medium sized salmon orange coloured flowers.

Dean Hole, a free flowering standard rose characterised by the numerous thorns on the stem bears large, double, full petalled silvery carmine flowers.

5. **Noisette Roses**: These climbing Roses are Hybrid of American origin, between China rose (Rose chinensis) and Musk Rose (Roce moschata). The chief characteristics are their free growth and continuous blooming with many flowerd corymbs of sweetly scented flowers of white, pink, red or yellow. The well known Noisette roses on the hills are :

Marechal Niel ; is one of the outstanding climbers in cultivation. The large fully double golden yellow flowers are of excellent shape. Growth is vigorous and foliage is of an attractive green colour.

Boule De Niege is a vigorous climber with pale green foliage. It bears medium sized flowers of pure white colour.

6. **The Provence or Cabbage Roses**: These are sweet scented and pretty and the best of them is one named Bullata, popularly known as the Lettuce Leaved Cabbage Rose. These are distinguished by their broad, wrinkled, deeply sevrate foliage which are bold and by the pendulous red flowers which are generally globular. These roses are not much favoured on the hills as well as in the plains due to their shy growth and poor flowering habits.

As already mentined the Hybrid Tea group has completely replaced all the other groups especially on the Nilgiri Hills. There are very many recognised varieties in this group. There are the hardy types like Columbia, President Herbert Hoover, General Mac Arthur, George Geary, Shot Silk, etc. which can be grown even at lower elevations, and delicate types like Golden Dawn, William Orr, E. G. Hill, Julien Potin etc.

Depending upon the height at which the plants are allowed to grow they can be further classified as bush, standard and half-standard types. The latter two are those that are grown on a rootstock after budding at a definite height of 18 to 24 inches in the case of the Standard types and to 15 to 18 inches in the case of the Half-Standard types. The bush types are usually grown from cutting of 6 to 8 inches from ground level.

Cultural Requirements: A deep rich and well drained loamy soil is ideal for roses, and in preparing beds the gardener should aim at improving his soil to this ideal condition. Very heavy clay soils can be improved by liming and the addition of sand girt and other opening materials. Places subject to high winds, frost and water stagnation are not suitable for this purpose.

Depending upon the space available, pits of 15″ × 15″ × 18″ or better larger are dug at 2½ to 3 feet apart. Through initial preparation of the ground is absolutely essential, since the rose is going to stay on the ground for atleast ten years. The pits should be dug well and an abundance of farm yard manure, leaf mould, sand and soil mixed in equal proportions should be filled in. Though no chemical fertilisers are applied in this country, in other countries, especially England, at the time of preparing the beds, a mixture of 3 parts bone-meal and one part of sulphate of potash at 3 handfuls to a suqare yard is applied.

September, October are the ideal months when roses can best be planted under Nilgiri conditions. The plants are watered copiously but care should be taken to see that water does not stagnate. Inadequate watering too, will lead to the exposure of the surface roots, which will consequently result in the drying of the plants. Manuring is done once a year with the application of a basket of farm-yard manure and compost mixed in equal proportions, during the spring when the plants are dormant. The manure will then prevent the soil from drying out quickly during spells of hot weather, and the plant foods will be washed down to the roots when these are fully active.

Propagation: It is very well known all the world over, that superior roses are not always grown on their own roots, but 'worked', i. e. grafted or budded on suitable root-stocks. It has also been found that strong plants capable of giving the finest flowers with quick growth can be obtained by budding the superior roses on the wild stock, getting the full benefit of the strong roots of the briar. Every country has its own group of wild briar rose stocks, and on the Nilgiris, *Rosa indica.* Linn has been to be the most suitable briar stock for superior roses, by experience at the Sim's Park, Coonoor.

So the propagation of roses consists not only in the establishment of the briar cuttings, but also in the successful bud insertions of superior roses on such established briars. Trials at the Sim's Park, Coonoor, for over a period of three years in the rooting and establishment of the briar cuttings have revealed that a success ranging from 60 to 100% is obtained during the rainy months of July to December, with a maximum success of 100% during October and November.

Similar trials on budding of superior roses on briar stocks over a period of three years have consistently indicated that the months of April,

May and November have given the highest percentage of 'bud-take'. The results have also indicated the possibility of fairly successfull bud insertions almost throughout the year under Coonoor conditions.

The usual practice is shield budding by the 'T' method. The briars are best planted in October – November and they become ready for budding by the following April – May and the plants begin to flower from the fourth month after budding.

The Bush roses as well as the Climbers are usully propagated by cuttings of the desired varieties of superior roses.

Pruning: The rose varieties that adorn the beds in gardens must all receive an annual pruning, if the best results are to be obtained from them. Hybrid Tea, Hybrid perpetuals and Hybrid Pernent roses require drastic pruning, while the others are usually given a light pruning. There are two schools in the art of rose pruning. One favours hard pruning and the other advocates long pruning. Though it is felt that long pruning produces plants with longer basal shoots it puts forth a poor spray of very inferior flowers, which are produced in abundance and in comparison with those from hard pruned bushes, they are miserable specimens. Hence only hard pruning is strongly advocated. Taylor (1945) maintains that hard or short pruning encourages growth and keeps the bushes in good condition. He further adds that short pruning maintains health and prevents debility and quotes instances of roses that have been hard pruned for over twenty years in good condition. McFarland and Pyle (1937) state that "pruning is not a thing to be afraid of, and that only by pruning hard can the grower expect to see handsome, brilliantly coloured flowers like those pictured in catalogues."

Hard pruning consists in removing all except three or four canes and cutting them back to 2 buds from the base. This is usually done for the roses on the Nilgiris during February to get the plants to peak bloom during April to June. The system of pruning that is usually practised on the Hills to the different types is given below:

1. *Newly planted plants:* The first pruning is usually severe and is done by removing all soft pithy growths, dead wood, and branches growing inwards and crowding the centre, leaving only four branches which are placed all round the plant to form a vase shape. Then these branches are cut back to two to three buds from the base leaving the topmost bud to be outwards so that the leading branches will continue to grow away from the centre without spoiling the shape of the plant.

In a few cases wherein the plant has not developed sufficiently and has only one branch, then this single branch is cut hard to develop two or three shoots from the eyes that are left, to form the future shape of the plant.

2. *Hybrid Tea Roses*: The dead and diseased shoots and cross-limbs are first pruned off followed by the cutting of the basal branches to two-third of their original lengths, the laterals from them being cut off to two or three buds.

3. *Hybrid Perpetuals*: Same as for Hybrid Teas, excepting that the main basal shoots are cut back to the past season's length and the laterals that remain on the basal shoot being pruned to five to six buds.

4. *Bedding Roses*: (Hybrid Teas.) Pruned very hard, cutting back the basal shoots which are restricted to five in number usually, to half of their lengths to allow new growths besides a general pruning of the dead wood and cross limbs.

5. *Climbing Roses*: Lightly pruned by removing all dead wood and thinning a few crowded branches. In four to five year old plants, one or two of the oldest shoots are cut back close to ground level, to encourage new shoots and in the subsequent years the removal of the older trees becomes an annual feature.

6. *Other types*: Little if pruning is necessary. (only removal of dead and diseased shoots).

Trimming after flowering: This is an unique operation being practised only on The Nilgiris. This consists in cutting back the shoots to 8 to 12 inches after the flowering is over, which facilitates the production of fresh blooms on those shoots within six weeks, and thus aids continuous blooming on the plants from April to August.

Suckering: In all budded rose plants, sometimes the stock plants, i. e. the wild rose give out branches which are called suckers and these should be removed as they are useless growths which if allowed to remain will kill the budded plant outright.

Pests and diseases: The important pest in the familiar aphid or plant lice, which cluster in great numbers on the tips of growing shoot and suck the sap from the young leaves and buds. These are controlled by frequent sprays of 1% tobacco decotion when the attack is noticed. McFarland and Pyle (1937) advocate the application of a mulch of tobacco to the stems which is said to discourage the appearance of the pest and is thought to have some fertilising value too.

The leaf cutting bee is another pest which often damages the foliage in a semi circular form. This is controlled by a spray of arsenate of lead. Scale attack on the stem also is common during the winter months and is checked by an application of 1% Fish oil soap.

Among the Major diseases, the black spot of leaf and the mildew are of some concern. The black spot occurs through atmospheric infection and the affected portions are best cut and burnt with a preventive spray of 1% Bordeaux mixture.

Mildew is one of the commonest diseases that the rose-grower has to contend with. Its damage is not so serious to the life of the plant, but it ruins the bud and foliage by covering them with a felty whitish coating. It can be cured, but it is doubtful if it can be prevented (McFarland and Pyle, 1937) except by keeping the plants in vigour. Dusting of Sulphur is said to be a check over this disease.

Some selections of the best Roses for all purposes: 1. *Roses for Exhibition Purposes*: Those who wish to grow blooms of exhibition quality of large size, beautiful forms and colour can depend upon the following varieties:—

Crimson Glory:	Velvety crimsion and fragrant.
Dame Edith Helen:	Fully double, glowing pink blooms.
Mrs. Sam McGredy:	Larged sized beautiful scarlet copper orange blooms.
Julien Potin:	Flowers primrose yellow large and double.
W. E. Chaplian:	Excellent Crimson rose which does not damage in wet weather.

2. *The Best Six for Garden Display*: For filling the rose beds and borders for a continuous and colourful display;—

Crimson Glory:	Velvety crimson and fragrant.
President Hoover:	A beautiful combination of vivid rose, coppery red and glowing orange yellow.
Eiole De Hollande:	An exceptionally fine variety with dark crimson flowers.
Madame Butterfly:	A beautiful rose with glowing salmon and flesh pink shade.
Shot Silk:	A mildew resistant variety with salmon orange coloured flowers.
Mrs. Sam McGredy:	A larged sized beautiful scarlet coppery orange bloom.

3. *The Six Best Scented Roses*:

Christopher stone:	Semi double flowers dark crimson scarlet in colour.
Dame Edith Helen:	Fully double glowing pink blooms.
General MacArthur:	An outstanding rose of deep scarlet flowers.
Lady Fortevoit:	A variety with characteristically large petals of golden yellow colour with apricot shape.

Mrs. G. A. Van Rossem:	An exceptionally beautiful rose with dark vivid apricot and golden yellow flowers.
Scented Daily Mail:	Deep red flowers of fine shape, highly scented.

4. *Best Standard Plants*:

Betty Uprichard:	Semi double to double flowers of pale salmon pink with carmin reverse.
Caroline Testont:	A hardy variety bearing large silvery, satin-pink globular flowers.
Columbia:	A prolonged bloomer with good shaped flowers of glowing rose pink.
Crimson Glory:	Velvety crimson and fragrant.
Frau Karl Druschki:	Finest white rose with every double flowers
Golden Dawn:	Hardy variety bearing lemon yellow flowers.
Julien Potin:	Flowers large, double and primrose yellow.
President Hoover:	beautiful colour combination of vivid rose coppery red and glowing orange yellow.

5. *Large Flowered Climbers*:

Madame Butterfly:	A beautiful climber with glowing salmon and flesh pink shade.
Lemon Pillar:	A climber with shapely flowers of sulphur yellow.
Lamarque:	Beautiful white clusters of flowers are borne.
Shot Silk:	Flowers are salmon orange in colour.

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   —do— Vol. No. LII No. 2693 (Nov., 11th '50)

Preliminary Studies on Raising Cardamom Nurseries Successfully

By

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Introduction : Cardamom are propagated in two ways. Old grown up clumps are lifted and split into planting units of each with a piece of underground stem (Rhizome) and one or two aerial shoots (pseudo stems). Each of these units is planted in a pit. Now aerial shoots develop from the rhizomes planted and a thick clump is formed in the course of two or three years. This is vegetative propagation. By adopting this method propagation is possible only to a limited extent as a clump cannot ordinarily be split up into more than 20 units for planting. The transport of planting materials to distant places will be a task especially in hills where alone cardamom grows. The planting will have to be done with in a week after lifting the rhizomes as they will deteriorate if kept longer. Further posts and diseases may pass on to the new plantation through the mother rhizomes and aerial shoots attached to them.

The second method of propagation is by sowing seeds, raising seedlings in nurseries and transplanting them in the field. The seeds that can be obtained from each clump are large in number, over 1,000 per clump per year. Hence an extensive propagation is possible by adopting this method. The seed material can be transported easily through any distance and can be treated against pests and diseases to shut out the possibilities of its carrying infection to the new plantation.

Much difficulty is being encountered by cardamom growers in raising cardamom nurseries successfully. Some planters experience trouble in getting satisfactory germination; others complain about extensive failures of seedlings after germination.

Investigations to evolve suitable methods of raising cardamom nurseries successfully were taken up in 1945 at the Cardamom Research Station, Singampatti Hills, Madras and the results achieved are described in this paper briefly for the benefit of cardamom cultivators with practical hints to raise the cardamom nurseries successfully.

Investigations : (1) *Seed Viability:* It is believed that cardamom seeds are best sown immediately after harvest. This appears to be against the common belief that seeds need some "rest" before sowing. Experiments were laid out to find out how long cardamom seeds retained their viability. Seeds were sown soon after harvest, 15 days after

harvest, a month after harvest and so on at intervals of a fortnight. Germination counts were recorded once a week and the data gathered showed that there was a clear and significant difference between viability of the seeds sown soon after harvest and that of the seeds sown after a "rest" of varying periods. If sowing is deferred by 1½ months, the loss of viability was 60% and if it is deferred by 4 months the loss was as high as 95%, Thus the common belief that cardamom seeds should be sown soon after harvest appears to be sound (for data vide Appendix I).

(2) **Best Season for Sowing:** Though fresh cardamom seeds are available almost throughout the year, it is believed that the best time for sowing seeds is the dry period preceding the South West Monsoon. Experiments conducted to determine the most suitable season for sowing showed that best results were obtained if sowings were done during the period between December and March (for date vide Appendix II).

(3) **Soil Texture:** Attempts were made to find out the most suitable soil texture for inducing good germination in seed beds. Well rotton black jungle soil spread on the nursery beds 1" thick was taken as control in this experiment. Mixtures of either sand, leaf mould, wood ash or cattle manure with the black jungle soil were compared with the control as four different treatments. Observations recorded showed that the percentage of germination in beds that received ash and cattle manure was significantly higher than that in the control beds. The seedlings that received those two treatments were taller and more vigorous than those that got other treatments (for data vide Appendix III).

(4) **Mulching:** Next to soil texture, mulching seed beds is an important factor that determines good germination. The merits of dry leaf mulch, jungle debris mulch (well decayed wood in powdery form) and dry grass mulch evenly spread on seed beds were compared with no mulch. It was seen that the grass mulch was the best and the jungle debris mulch next best in inducing good germination (for data vide Appendix IV).

(5) **Seed Pre-Treatment:** Two experiments were laid out to find out the effect of pre-treatment of seeds on their germination. In one experiment, seeds were soaked in cowdung slurry, tapid water, cold water or Hortome A (O. 3%) each for 12 hours and then sown. There was no significant difference in germination under the above treatments. Vigour of seedlings also was not affected by the treatments. In the second experiment, the seeds were treated with fungicides such as copper sulphate, corasan, agrosan, sulphur and mercuric chloride. These treatments were also found to have no effect on germination. The seeds so treated did not give any significantly higher percentage of

germination, than the untreated control. But it was found that by shaking the seeds in a bottle with fine course sand germination was improved. This is probably due to the scratches made (scarification) on the seed coat by shaking with the coarse sand. The increased percentage of germination of scarified seeds was significant (for data see Appendix V).

(6) **Spraying Trials:** Spraying the seedlings with Bordeaux mixture and colloidal copper of different concentrations as a prophylactic measure were tried at intervals of a week and a fortnight. Observations showed that in the untreated plots the seedlings were fewer than and not as healthy as in the treated plots. The good effects of spraying were thus apparent. Both the fungicides were effective in controlling "Nursery Katte". Fortnightly treatments were better than weekly treatments (for data vide Appendix VI).

Useful Hints to Planters: Based on the results of the above investigations, some useful hints are given hereunder for the benefit of the planters to guide them in the methods of raising cardamom nurseries successfully.

(1) **Preparation of Seed Beds:** The selection of a suitable site for locating the nurseries is of primary importance. A site near a water source is preferable as it will reduce the cost of watering. It is better if the site is surrounded by jungle trees affording protection against hot sun in summer. If the land is slopy, terraces are to be formed and reinforced with logs and poles. Prepare beds each about $3' \times 3'$ on the terraces. Stir the soil and pick out the pebbles and stones in them. Import well decomposed black soil from the jungle and spread it over the beds 1" thick. Spread a thin layer of mixture of equal quantities of well rotten cattle manure and wood ash over the jungle soil. Some unwanted seeds are sure to exist in the original and imported soils. in the seed beds. To get rid of them water the beds frequently for a period of about a fortnight. Such seeds will germinate and can be removed. Put up suitable sheds with the materials available in the forest to give protection to seed beds against sun and rain.

Sowing: It is better to start cardamom nurseries between the the month of December and March. During this period fresh cardamom seeds are available in plenty. Seeds harvested should be sown without much delay within a fortnight. The selection of seed material is a very important factor in cardomom cultivation. Seeds are to be gathered from plants that possess such desirable characters as good yield, bold pods, compact panicle, resistance or tolerance to pests and diseases. The pods selected are to be fully ripe. Gently squeeze out seeds from them and reject un-developed ones. It is necessary that the sweet

mucilagenous and sticky coating on the surface of the seeds is to be removed by washing the seeds for 4 times in a bucket of water. if one fails to do this thoroughly, the seeds stick on together and drop in lumps, while sowing. The sown seeds are also carried away from seed beds by ants which are attracted by the sweet mucilage. Sow the seeds shallow in beds. It is enough if the seeds are just buried on the surface. It has been found that for a bed of 3′ × 3′ size 720 seeds are quite enough. This works upto 80 seeds per square foot. Between adjacent beds, it is better to leave an interspace of about 6″. After the sowing is over, cover the beds with a layer of fine sand about ¼″ thick. Over this spread a 1″ layer of dry grass or leaves cut into fine pieces to serve as mulch. This mulch is useful to (a) retain moisture and (b) to maintain optimum temparature for the germination of seeds and development of seedlings. After the mulch is spread up irrigate the beds using rose cans for the purposes. Frequent watering is necessary in the early stages. Let the beds be moist always but not too wet. Germination usually starts one month after sowing and proceeds slowly little by little upto 7 or 8 months. When germination has advanced to an appreciable extent, periodical spraying with fungicides is necessary to protect the seedlings against fungus diseases. Even when the seedlings look healthy, it is wise to spray them onces a fortnight with Bordeaux mixture (p. 5%) as a prophylactic measure.

When the seedlings are about one year old they will be fit for transplanting. It is not safe to transplant them in the field straight away. They need some more care-taking in a second nursery. The latter can be prepared in a convenient place near a water source and under the shade of jungle trees. Small pits 6″ × 6″ × 6″ may be dug 2 to 3′ apart either way in the area selected. A mixture of cattle manure and ash may be applied in small quantities to each of these pits. Seedlings can be transplanted in them in a slightly slanting position against the direction of the wind. It is very important to do the planting right in the thick of the monsoon season. Otherwise irrigating the second nursery will be very costly. After a care of one year in the second nursery the seedlings will be fit for transplanting permanently in the field.

Acknowledgment: The author is very much indebted to Mr. K. M. Thomas for his valuable guidance in the layout of the experiments and to Mr. D. Marudarajan and Mr. G. Venkatanarayana in preparing this note. The experiment was started by Mr. P. Abraham when he was the Cardamom Specialist. Observations were made and conclusions drawn by the author. The Managers of the Singampatti Group of Estates, gave all facilities to conduct the experiments in their plantation for which the author thanks them.

APPENDIX I.
Seed Viability

Treatment	Germination as persentage on control	S. E. of the difference between two treatment means	Whether the difference is significant or not P·0·05	Critical difference
a. Seeds sown soon after Harvest - Control	100·0			
b. Seeds sown 15 days after Harvest	46·1			
c. Seeds sown 1½ months after Harvest	39·3			
d. ,, 2 months	22·5			
e. ,, 3 months	16·8	14·81	YES	30·24
f. ,, 3½ months	6.0			
g. ,, 4 months	2·8			
h. ,, 4½ months	4·2			
i. ,, 5 months	8·2			
j. ,, 5½ months	7·4			
k. ,, 6 months	5·7			
l. ,, 6½ months	2·5			

Conclusion: a b c d e i j f k h g l

APPENDIX II.
Best season for sowing

a. Seeds sown in March	119·6	
b. ,, January	114·7	
c. ,, December	106·2	
d. ,, February	100·0	
e. ,, May	92·9	
f. ,, July	92·4	
g. ,, April	92·0	22·94 YES 46·71
h. ,, October	83·1	
i. ,, November	79·6	
j. ,, June	71·1	
k. ,, September	58·2	
l. ,, August	23·6	

Conclusions: Mar. Jan. Dec. Feb. May July April Oct. Nov. June. Sept. Aug.

APPENDIX III.
Soil Texture

A. Control - Black jungle soil only	100·0			
B. Sand Black Jungle soil	103·32			
C. Leaf mould-black jungle soil	99·92	4·93	YES	10·45
D. Ash - Black jungle soil	131·42			
E. Cattle manure - Black Jungle soil	120·97			

Conclusion: D. E. B. A. C.

APPENDIX IV.

Mulching

Treatments	Germination as percentage on control	S. E. of the difference between two treatment means percent	Whether the difference is significant or not P·0·05	Critical difference percent
A. Dry leaf mulch	203·92	90·1	YES	103·9
B. Jungle debris	436·27			
C. Green grass mulch	663·72			
D. Control	100·00			

Conclusions: C. B. A. D.

APPENDIX V.

Seed Pre-treatment

a. Seeds scarified	333·96	63·68	YES	138·76
b. Seeds scarified and treated with tapid water	167·00			
c. Seeds treated with tapid water	107·55			
d. Control - no treatment	100·00			

Conclusions: a. b. c. d.

APPENDIX VI.

Spraying Trials.

1. Bordeaux Mixture 0·5% weekly	135	61·4	YES	126·8
2. Bordeaux Mixture 0·5% fortnightly	186			
3. Bordeaux Mixture 1·0% weekly	133			
4. Bordeaux Mixture 1·0% fortnightly	151			
5. Colloidal copper 3·20 weekly	233			
6. Colloidal copper 3·20 fortnightly	277			
7. Colloidal copper 3·10 weekly	204			
8. Colloidal copper 3·10 fortnightly	260			
9. Control	100			

Conclusions: 6 8 5 7 2 4 1 3 9

Review of Literature on Rainfall as Fertilizer

By

C. BALASUBRAMANIAM

and

M. V. JAYARAMAN

Besides supplying water, which is inevitable for plant growth, rainfall acts also as fertilizer by supplying to plants certain minerals like N, P, S, Cl, Ca, etc. Even from the days of Leibig (1847) the manurial value of rainwater has been a highly controversial problem, particularly in regard to Nitrogen.

In the latter half of the nineteenth century analysis of rainwater received the attention of the scientists in most of the European countries. In majority of the analysis the duration of study extended to only short periods and this might have been the reason for the conflicting nature of the results. N. H. J. Miller of Rothamsted studied it as his life problem for 13 years (1888—1889 to 1900—1901) and concluded that rainfall could enrich Nitrogen content of the soil in an area of one acre to the tune of 3·8 lb. per year. The analysis of rainwater for the period 8888—1893 has revealed that at Madras an average rainfall of 39·21″ could add to an acre of soil 1·91 lb. Nitrogen per year.

With reference to Dehra-Dun and Cawnpore, J. Walter Leather (1906) has reported that 86·48″ and 49·36″ of rainfall could respectively add to an acre 3·405 lb. and 3·250 lb. of Nitrogen per year. Crowther and Rustan have reported 7·8 lb. to 18·4 lb. of nitrogen per acre at different stations at Leeds. The high figure at Leeds may be due to the proximity of the field to the industrial concerns. Majority of workers in the different places have reported 3 to 4 lb. of ammonia per acre per annum.

In regard to other minerals, N. H. J. Miller at Rothamsted has determined 14·87 lb, of Cl. per acre per annum and 17·41 lb. of So_3 per acre per annum. R. C. Collisson of Geneva (New Yark) reports, from a study of ten years data, an average of 41·25 lb. of sulphur per acre per annum and 15·67 lb. of Cl. per acre per annum could be added to the soil by rainfall. The same author states that 59·36 lb. of $Hc0_3$ is available from rainwater per acre per annum with a wide range of variation of 11·95 lb. in 1926 to 91·86 lb. in 1922.

Ingham (South Africa, 1950) reports that in addition to the mineral elements gained by the soils from rainfall, the soils themselves, because of their organic and inorganic collodial contents, absorb huge quantities of mineral substances and thus replenish themselves. He contends that the

physical nature of the soil is responsible for fixing atmospheric nitrogen etc., even though the bacteria play some part in the fixation of atmosphic nitrogen in the soil. He reports that pure cellulose like Watmann Filter papers can absorb 40 to 50 p. p. m. of nitrogen in 24 hours, by purely physical process, and when calculated on acre basis this can add 30 to 50 lb. of nitrogen per acre per annum.

Ingham (1950) states that moist soil absorbs twice as much nitrogen as that contained in rainwater itself and rainwater improves the efficiency of the soil two fold. Rainwater allowed to stand in a porcelain dish absorbs as much ammonia in 24 hours as to supply 9·7 lb. per acre per annum.

The absorption by organic colloids is not confined to nitrogen alone but applies equally to lime, phosphate, potash and other mineral substances. Ingham (1950) reports that leaves of trees, still attached to plants can absorb a good lot of these mineral substance from the atmosphere and rain falling over these trees bring down a good lot of mineral elements. The following table is presented by him to show the change in mineral content of rain after falling over trees.

	From rain only	From drips from trees
	Lb. per acre per annum	Lb. per acre per annum
NH_4N	9.5	28·6
No_3N	1·1	1·1
Cl	162·8	411·4
Cao	95·7	337·7
P_2o_5	3·7	22·0
K_2o	42·9	287·2

It was observed that the leaves absorb further quantities of these substances in a few days after leaching.

In conclusion it may be stated that intensive research on the manurial value of rainfall with reference to different zones in any country may even alter the manurial requirements of cultivated economic crops in that country.

Casuarina Equisetifolia

By

EBENEZER JACOB,
Dt. Forest Officer, Vynaad Division.

Introduction: The casuarina plantation is of an irrigated nature; water is being supplied from wells sunk inside the plantation at the rate of one well to irrigate every two acres. Because of the loose, porous sandy nature of the soil and the nearness to the river (Cavery and Coleroon) water is struck at a depth of from 8 to 10 feet from the ground level. A sort of crib-work is being put on the sides of the well to prevent the well being silted up constantly by the loose river sand from the sides.

The spacement adopted in Padugai Range is $7' \times 7'$. This gives 900 seedlings per acre. Alignment and staking are taken up by May and completed by the middle of June and then pits 1 foot cube are dug at the places maked by the stakes, the excavated earth being kept heaped close to the pits. This is generally completed by the middle of July so that, planting of the seedlings can be taken up immediately after the premonsoon slowers.

Seedlings of about $1\frac{1}{2}$ to 2 feet in height are very carefully picked out from the nursery beds and transported as quickly as possible to the area of planting. For planting areas which are 15 acres and above, the nursery beds will be located inside the area itself and for smaller planting areas, seedlings are being supplied from central areas located in convenient places.

Planting Details: The heaped up earth near each pit is being put back into the pits to a depth of about $\frac{3}{4}$ foot and one full pot of water is being poured into each pit. Then the soil is well puddled and one seedling of Casuarina per pit is planted firmly in the centre of the puddled earth. Again another full pot of water is added to each pit. As far as possible, the entire area in each locality is planted up in the course of about a week to ten days, depending on the labour available in the locality and the area to be planted.

The Casuarina seedlings are watered on a regular scheme from the date of planting upto one Year. The rainy days are generally excluded. The watering schedule that is in vogue after the first day of planting is as follows:

1. From the middle of July to the end of July-one pot of water per plant daily for 15 days.

2. From the beginning of August to the middle of August-half a pot of water per plant daily for 15 days.

3. From the middle of August to the end of December-half a pot of water per plant on alternative days for (roughly) 75 days.

The total number of days from 16th August to the end of December of the same Year comes to 138 days.

4. From the beginning of January to the end of March-half a pot of water per plant once in three days for 90 days.

5. From the beginning of April to the end of July-half a pot of water per plant once in three days for 100 days (About 22 days are expected to be rainy days during this four-month period.)

From experience it is found that replacement of casualties can be done till the end of November. After this date, the Padugai soil in and round Tiruchirapalli gets very try and any amount of watering after replacement will not be of much use to the plants.

Tending: Weeding round the plants is done twice a year once in November and again in February. Thinning is not done in Casuarina plantations raised departmentaly; but in the case of private plantations, it is done after the third or fourth year. This is found necessary, as the planting is almost $2' \times 2'$ in case of private plantations. Further, these early thinnings yield interim revenue to the owners. In the departmental plantations, pruning of the side branches upto a height of about five feet is tried in plantations where the average height of the trees is 12 feet and above to improve the condition of the trees. After this pruning, the trees seem to put on some height-growth. The brushwood cut and removed also yield a small initial revenue to the Department.

Research Note

Buckwheat *(Fagopyrum species)* A Useful Foodgrain & Green Manure Crop Possibilities for Extension on the Nilgiris

The important foodgrain crops raised on the Nilgiris are wheat, barley, *Ragi (Eleusine coracana)* and *Samai (Panicum miliare)* over limited areas. These take nearly six months to mature. Hence the urgent need for a quickgrowing food crop is patent. Buckwheat can be easily filled in for the purpose, in view of the points recorded below :—

The crop comes to harvest in about 100 days after sowing. No pre-sowing cultivation is necessary, as the seeds can be broadcast, at 40 to 50 lb. per acre, directly after the lifting of the potatoes and covered. No manuring need be done since the residue of the manures applied to the preceeding potato crop is enough.

Germination is quick and the crop branches freely and forms a canopy over the land, covering the soil against erosion. Its bushy habit effectively checks weed growth. Buckwheat comes up without any irrigation or aftercultivation.

When mature, the plants are pulled out, dried on the yard and the grain threshed out by sticks. An average of 400 to 500 lb. of grain per acre is a normal yield. The seeds are brown, shiny and flat with sharp angles.

For use as food, the grain is sun-dried, milled and sifted, when the chaff separates out from the meal. The flour is a good substitute for wheat and rice flour and can be used in a variety of indigenous preparations, and as a supplement to wheat flour for making bread and *chapathis*.

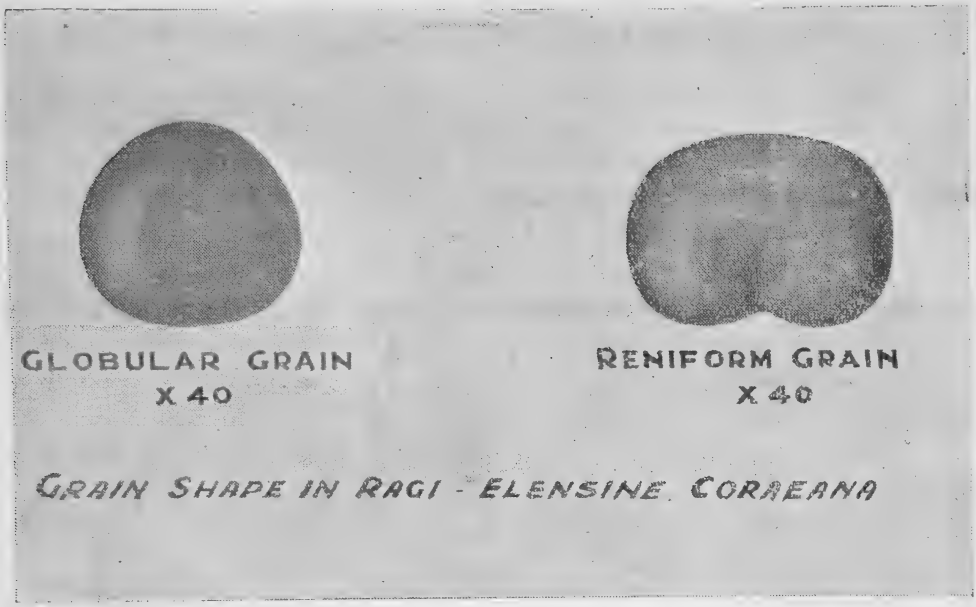
An analysis of the grain raised at this Station by the Nutrition Research Laboratories, Coonoor, revealed that buckwheat contained 12·3 per cent protein of high quality besides the three principal B vitamins, viz., Thiamine and Riboflavin at 300 and 341 micrograms respectively per 100 grams, and Nicotinic acid at 0·81 milligrams per 100 grams.

Apart from its value as a food crop, buckwheat makes an excellent green manure crop. If not required for grain, the crop can be ploughed down into the soil. The Stem being succulent, it decays very soon, supplying rich humus to the typical porous, highly acid soils of the hills increasing its manurial value. Within a period of two months an acre yield of 10,000 to 15,000 lb. of green leaf can be obtained. The dry stalks, after separation from grain, can be easily composed. Flowering is profuse and the crop offers a good pasturage for honey bees. Buckwheat is also tolerent to frost and drought.

Agrl. Research Station,
Nanjanad.

K. Saptharishi.
M. D. Azariah.

Reniform grain shape in Ragi-Eleusine coracana (Gaertn)



Globose shape is the usual grain shape in Ragi-Eleusine Coracana (Gaertn). While studying a few samples of Ragi received from East Africa (through the Indian Agricultural Research Institute, Delhi), it was observed that some of them have a different grain shape from the normal globular grains that are usual in this Millet. These are slightly flat and cylindrical with a difinite constriction towards the mycropylar region. They are slightly, longer transversely than in the median plane and have the shape somewhat resembling the kidney. As the new grain shape of Ragi resembles the kidney, it is designated as "*Reniform*".

Linear measurements of 400 grains in each of the Reniform and globular type of Ragi were taken. In the readings given 'L' represents the horizontal and 'B' the vertical measurements of the grains respectively, seating the grain on the micropyle. The averages of the readings and the L/B index are given below:

Grain measurements of normal and reniform grains (in Millemeters)

	Normal globular grain Ragi Co. 1. of Coimbatore		Reniform grain (East African Ragi)	
(Horizontal)	L	1·79 ±0072	L	1·89 ±0088
(Vertical)	B	1·79 ±0078	B	1·48 ±0131
Shape. Index.	L/B	0·99 ±0011	L/B	1·27 ±0049
Weight of 100 grains		·276±0006 gms.	Wt. of 100 grains	·294±0041

The mean difference of L/B index between the two types of grains is significant. The new grain type is kidney shaped, the length being definitely greater than the breadth while the usual Ragi grain is globular. The accompanying plate illustrates the two types of Ragi grain. The reniform ragi grain is slightly heavier than the globular variety, the difference in weight between the two types being significant. Reniform grains seem to be an exclusively African character; as such grains have not been so far met with in the selections of Indian origin or of other sources. At the Millet Breeding Station, Coimbatore, studies are now is progress to isolate pure lines for this character and study their genetic inheritance.

Agricultural College and
Research Institute, Lawley Rd. P. O.,
Coimbatore, 28—12—1951.

K. Divakaran
and
P. Krishna Rao.

Weather Review — For July 1952

RAINFALL DATA

Division	Station	Total rainfall for the month	Departure fromnormal in inches	Total since 1st January in inches	Division	Station	Total rainfall for the month	Departure fromnormal in inches	Total since 1st January in inches
Orissa & Circars	Gopalpur	5·7	—1·5	11·5	Central Contd.	Vellore	1·7	— 2·9	7·4
	Calingapatnam	4·8	—0·7	11·9		Gudiyatham*	2·1	— 1·2	7·4
	Visakhapatnam	4·4	0·0	13·5		Salem	7·5	+ 3·7	14·0
	Arakuvalley*	11·0	+1·0@	25·1		Coimbatore (A. M. O.)*	1·3	— 0·5	3·2
	Anakapalle*	7·8	+1·9	17·8		Coimbatore	1·3	— 0·4	3·4
	Samalkot*	4·3	—3·9	17·1		Tiruchirappalli	5·5	+ 4·4	8·1
	Kakinada	3·6	—3·0	19·2					
	Maruteru*	3·6	—5·3	11·4	South	Nagapattinam	2·9	+ 1·2	10·0
	Masulipatnam	2·2	—4·2	9·3		Aduturai*	4·3	+ 2·6	11·5
	Guntur*	2·9	—3·8	9·0		Pattukottai*	5·5	+ 1·8	11·9
	Agrl. College, Bapatla*	3·9	—1·9	12·7		Mathurai	1·0	— 1·0	8·5
						Pamban	0·9	+ 0·4	11·1
	Agrl. College, Farm, Bapatla*	3·4	X	11·2		Koilpatti*	0·4	— 0·2	6·2
						Palayamcottai	0·0	— 0·3	6·5
	Rentachintala	3·8	—1·0	9·0		Ambasamudram*	0·2	— 0·6	12·0
Ceded Districts	Kurnool	3·8	—0·6	23·5	West Coast	Trivandrum	3·3	— 4·5	32·0
	Nandyal*	1·7	—4·6	22·4		Fort Cochin	10·9	—12·4	60·1
	Hagari*	0·7	—0·7	6·3		Kozikode	17·6	—16·7	59·1
	Siruguppa*	3·9	+0·8	11·8		Pattambi*	17·7	— 7·8	42·5
	Bellary	0·5	—1·1	5·2		Taliparamba*	28·0	—17·9	71·9
	Cuddapah	1·4	—2·7	12·7		Nileshwar	39·7	— 4·6	93·5
	Kodur*	4·3	+0·3	14·3		Pillicode*	32·0	— 9·7	78·4
	Anantapur	1·5	—1·1	5·5		Mangalore	27·2	—12·2	76·2
						Kankanady*	29·4	—13·2	77·8
Carnatic	Nellor	0·2	—2·6	16·0					
	Buchireddipalem*	0·4	—2·3	12·8	Mysore & Coorg	Chitaldrug	2·3	— 0·6	6·5
						Bangalore	4·8	+ 0·9	12·8
	Madras (Meenambakkum)	0·9	—2·7	18·5		Mysore	3·3	+ 0·6	11·4
						Mercara	28·6	—14·5	57·3
	Tirurkuppam*	2·8	—2·1@	16·4	Hills	Kodaikanal	2·8	— 1·9	19·4
	Palur*	3·1	—0·2	7·5		Coonoor*	1·3	— 2·0	20·3
	Tindivanam*	0·6	—2·5	8·0		Ootacamund*	2·7	— 3·8	10·7
	Cuddalore	2·4	—0·2	6·9		Nanjanad*	4·2	— 6·1	15·8
Central	Arogyravaram (Chittoor dt.)	1·3	—1·1	7·3					

Note:—

1. * Meteorological Stations of the Madras Agricultural Department.
2. @ Average of *nine years* data for Tirurkuppam and seven years data for Arakavalley is given as normal.
3. Average of ten years' data is taken as normal.
4. X The Farm was started only last year.

Weather Review for July 1952.

Monsoon had been generally weak over the country during the beginning of the month. On 2—7—1952 unsettled conditions were observed over the North Bay of Bengal owing to the movement of a low pressure wave from Burma into this region. The unsettled conditions concentrated in to a depression on the next day and while moving towards North-West, further intensified into a cyclonic storm and crossed the coast near Contai on the eve of 4—7—1952. After crossing the coast it weakened, moved towards West-North-West and North-West and became unimportant on 9—7—1952 over North-West Uttar Pradesh. The low pressure wave which was moving westwards across the North and the Central Burma on 9—7—1952 moved away North-westwards and became unimportant. A well marked trough of low was seen in the West Central and the adjoining South-West Bay of Bengal on 11—7—1952 and in consequence monsoon strengthened over Tamil Nad. The low persisted off and along the North Coromandal-Circars Coast on 12—7—1952 and became unimportant on the very next day, with the result that the monsoon had been markedly active over the South Peninsula on 12—7—1952. The axis of the monsoon trough which was hitherto lying along the foot of the Himalayas from 1—7—1952, shifted Southwards on 13—7—1952, causing strengthening of the monsoon along the Konkan-Kanara Coast. A feeble low appeared over coastal Gangetic West Bengal and the adjoining Head Bay of Bengal on 19—7—1952 and concentrated into a shallow depression on the following day near Lat. 20½ N. and Long 88 E. This crossed the North Orissa Coast, persisted almost over Chota Nagpur and adjoining parts of Madhya Pradesh, weakened and merged with the seasonal trough on 24—7—1952. In the meanwhile on 19—7—1952 itself a shallow low existed over West Rajasthan and the adjoining parts of Sind and after persisting for three days weakened to a low pressure area, on 22—7—1952, which became unimportant after two days. This increased the vigour of the monsoon along the West Coast. On 26—7—52, a shallow low appeared over the Gangentic West Bengal and the adjoining parts of Orissa and on the same day another shallow depression formed over East Rajasthan and neighbourhood. The former concentrated into a depression on the next day but weakened quickly and merged with the seasonal trough after a day. The latter remained practically stationary for a day and weakened.

A low pressure wave repaidly moved Westwards across Upper Burma into the Noth Bay of Bengal on 30—7—52 and caused unsettled conditions which concentrated into a depression on the last day of the month near Lat.21½° N,. Long 90° E.

Four Western disturbances passed over North-West of India during the month.

Note-worthy falls during the month of July

S. No.	Date	Place	Rainfall for past 24 hours.
1.	5—7—52	Fort Cochin	2·1"
2.	12—7—52	Salem	4·9"
3.	,,	Bangalore	3·5"
4.	,,	Tiruchirapalli	2·5"

S. No.	Date	Place	Rainfall for past 24 hours.
5.	17—7—52	Rentachintala	2·7″
6.	24—7—52	Mercara	3·9″
7.	,,	Kozhikode	2·5″
8.	,,	Mangalore	3·1″
9.	29—7—52	Palghat	3·0″

ZONAL RAINFALL

S. No.	Name of Zone	Average Rainfall	Departure from Normal	Remarks.
1.	Orissa and Circars	4·9″	—1·8	Below normal
2.	Ceded Districts	2·0″	—1·5	Below normal
3.	Carnatic	1·5″	—1·8	Below normal
4.	Central	3·0″	+ 0·3	Just normal
5.	South	1·9″	+ 0·5	Just normal
6.	West Coast	22·9″	—11·5	Far below normal
7.	Mysore and Coorg	9·8″	—3·4	Below normal
8.	Hills	2·8″	—3·5	Far below normal

Agricultural Meteorology Section,
Lawley Road P. O., Coimbatore,
Dated, 6—8—1952.

M. B. V. N., C. B. M., & M. V. J.

Weather Review — For September 1952

RAINFALL DATA

Division	Station	Total rainfall for the month	Departure fromnormal in inches	Total since 1st January in inches	Division	Station	Total rainfall for the month	Departure fromnormal in inches	Total since 1st January in inches
Orissa & Circars	Gopalpur	6·7	—0·8	25·9	Central Contd.	Vellore	0·7	— 6·2	12·6
	Calingapatnam	10·4	+3·5	28·3		Gudiyatham*	1·3	— 3·0	10·9
	Visakhapatnam	1·9	—4·7	17·9		Salem	5·0	— 1·0	23·7
	Arakuvalley*	7·1	—1·8@	39·0		Coimbatore (A. M. O.) *	1·4	— 0·1	5·5
	Anakapalle*	6·0	—1·6	27·6		Coimbatore	1·4	— 0·2	5·5
	Samalkot*	1·2	—4·7	21·0		Tiruchirappalli	0·0	— 4·0	10·0
	Kakinada	3·1	—3·1	25·0					
	Maruteru*	8·5	—0·8	24·4	South	Nagapatinam	0·8	— 2·5	13·0
	Masulipatnam	3·0	—3·4	19·7		Aduturai*	1·7	— 2·3	15·8
	Guntur*	4·1	—1·0	16·0		Pattukottai*	1·3	— 2·0	18·4
	Agrl. College, Bapatla*	7·3	+1·0	22·4		Mathurai	2·9	— 1·8	13·9
	Agrl. College, Farm, Bapatla*	5·0	..	18·5		Pamban	0·0	— 1·1	11·4
	Rentachintala	2·6	—2·2	14·3		Koilpatti*	0·9	— 1·1	7·2
						Palayamcottai	0·4	— 0·8	6·9
						Ambasamudram*	0·1	— 1·6	12·1
					West Cost	Trivandrum	1·0	— 3·5	37·2
Ceded Districts	Kurnool	2·8	—3·2	29·0		Fort Cochin	1·6	— 6·1	80·0£
	Nandyal*	1·7	—4·6	26·7		Kozhikode	0·5	— 6·1	73·7
	Hagari*	3·8	—1·2	10·6		Pattambi*	1·1	— 5·4	54·4
	Siruguppa*	1·1	—5·3	15·1		Taliparamba*	1·8	— 9·0	96·0
	Bellary	1·4	—3·5	6·9		Wynaad*	4·0	— 3·2	44·6
	Cuddapah	1·2	—4·8	17·6		Nileshwar*	1·3	—12·2	113·5
	Kodur*	3·5	+0·3	21·6		Pillicode*	1·4	— 9·8	97·1
	Anantapur	2·0	—4·3	8·6		Mangalore	1·4	— 8·0	97·9
						Kankanady*	1·4	—11·2	99·9
Carnatic	Nellore	0·4	—4·1	20·3					
	Buchireddipalem*	1·7	—2·1	17·8	Mysore & Coorg	Chitaldrug	3·2	— 1·2	11·9
	Madras (Meenambakkum)	0·8	—3·9	24·0		Bangalore	3·0	— 3·7	21·9
						Mysore	3·2	— 1·8	16·8
						Mercara	4·2	— 6·9	97·9
	Tirurkuppam*	0·8	—5·4@	22·2	Hills	Kodaikanal	4·5	— 2·8	28·5
	Palur*	0·0	—6·5	12·4		Coonoor*	1·0	— 2·8	23·5
	Tindivanam*	0·1	—5·7	10·7		Ootacamund*	4·0	— 1·0	16·7
	Cuddalore	0·6	—4·6	13·6		Nanjanad*	4·4	— 1·4	22·6
Central	Arogyravaram (Chittoor dt.)	2·5	—2·6	11·1					

Note :—

1. * Meteorological Stations of the Madras Agricultural Department.
2. @ Average of nine years' data for Tirurkuppam and seven years' data for Arakuvalley is given as normal.
3. Average of ten years' data is taken as normal.
4. X - The Farm was started only last year.
5. £ Errata. The total upto 31—8—52 was 78·4 and not 70·4.

Weather Review for September 1952

The trough of low pressure which appeared over the north and the adjoining Central Bay of Bengal on the last day of August, 1952 became unimportant on the very next day. On 1—9—52 a trough of low extended from east Vindhya Pradesh to Orissa and the adjoing Gangetic West Bengal, persisted for two days and got filled up on 3—9—52. On 4—9—52 a low pressure wave moved into the Central Bay of Bengal from Central Burma, causing unsettled conditions and a trough of low over the west-central and the adjoing North-West angle of the Bay of Bengal, which passed inland as a low pressure wave across Orissa–North Circars Coast on 6—9—52. A feeble trough of low lay off Kathiawar–North Konkan Coast on 7—9—52 causing widespread showers in Malabar and South Kanara. On the same day the seasonal trough of low extended into the Nort-West Bay of Bengal and the adjoining west-central Bay causing unsettled conditions which concentrated into a depression on 10—9—52 with its centre within ½° of latitude 19½° N. and longitude 88° E. The depression weakened on the following day to a trough extending from South-West Uttar Pradesh to the North-West Bay of Bengal, moved towards north-west and became unimportant over north-west Uttar Pradesh and the Punjab (I) 13—9—52. A low pressure wave moved into the East-central and the adjoining North-East Bay of Bengal on 14—9—52 causing markedly unsettled conditions which moved westwards and passed inland as a low pressure wave on 18—9—52. Another low pressure wave moved into the north and the adjoining central Bay of Bengal from Central Burma on 21—9—52 causing unsettled conditions, which passed inland on the very next day as a low pressure wave and lay as a trough of low extending from Bihar to South-West Uttar Pradesh. This shallow low moved North-Westwards and became unimportant after two days. Yet another low pressure wave from Burma moved into the East-central Bay of Bengal and the adjoing North Andaman Sea on 26—9—52 and caused unsettled conditions in the Bay of Bengal, which presisted upto the end of the month. In the meanwhile on 29—9—52 another low pressure wave from Burma moved into the Andaman Sea. On the same day a shallow trough of low lay over the east Arabian Sea off Kanara konkan coast, which moved inland on the following day itself. South-West monsoon has withdrawn from North India and the central parts of the country on 29—9—52.

During this month two feeble western disturbances passed over North-West India.

Day temperatures were generally above normal over the Region, except on 5—9—52 and 28—9—52 with slight fluctuaions in the different zones.

Note-worthy falls during the month of September

S. No.	Date	Place	Rainfall for the past 24 hours.
1.	1—9—22	Kakinada	2·1″
2.	4—9—52	Alleppy	2·1″
3.	21—9—52	Calingapatnam	2·5″
4.	26—9—52	Salem	3·6″
5.	,,	Mysore	3·0″
6.	28—9—52	Ooty	2·2″

ZONAL RAINFALL

S. No.	Name of Zone	Average Rainfall	Departure from Normal	Remarks.
1.	Orissa and Circars	4·9"	—1·7	Below normal
2.	Ceded Districts	2·2"	—3·3	Far below normal
3.	Carnatic	0·6"	—4·5	Far below normal
4.	Central	1·8"	—2·1	Below normal
5.	South	1·0"	—1·7	Below normal
6.	West coast	1·6"	—7·5	Far below normal
7.	Mysore and Coorg	3·4"	—3·4	Far below normal
8.	Hills	3·5"	—2·0	Below normal

Agricultural Meteorology Section,
Lawely Road, P. O,, Coimbatore,
Dated, 11—10—1952.

M. B. V. N., C. B. M., & M. V. J.

Agricultural Newsletter

Periamanjal Irungu—a new economic variety of sorghum: The Irungu Cholam of the Southern dirtricts is grown mainly as a fodder crop in the Ramanathapuram and Tirunelveli districts with a heavy such rate of 60 lb. per acre. An acre yield of nearly 5000 lb. of dry straw of very fine quality is obtained. The grain yield is poor. It is brown in colour and is unsuitable for consumption due to bitter taste.

The irungu cholam grown in the Madurai district and in the adjacent taluks of the Tiruchirapalli district has, however, a white grain and is consumed. The seed rate adopted is 15 lb. per acre and about 600 lb. of grain is obtained.

A new variety of cholam "Periamanjal Irungu", a cross between Irungu cholam of the Southern track and the Periamanjal cholam of the Coimbatore tract, has been found to give interesting results in the entire irungu tract both as fodder and as a food crop. It has the same duration as irungu cholam, but possesses bolder grains yellow in colour. The new variety has given nearly 50% more yield than the local as a food crop in the Madurai tract. As a fodder crop it has given a higher yield than the irungu cholam, and in addition, gives 350 lb. of grain fit for human consumption. The new variety has every chance of replacing the local irungu cholam of the tract.

2. **Irrigability of the black soils of the ceded districts:** There is a general mis-conception that black soils cannot be irrigated with ease and without fear of salts coming up to the surface. The failure of the irrigation projects, particularly Nira Valley, is responsible for such a fear.

The factors responsible for the accumulation of salts in the surface soil layer are (1) the use of water with a high salt content; (2) the rise of the water table near the surface which leads to salts moving to the surface; (3) excessive use of irrigation water with poor drainage facilities; (4) presence of an impervious substratum underlying the soil preventing downward percolation of water and causing formation of a perched water table.

In the case of the Thungabadra project, the water is of good quality, the salt content being very low. Hence, factor No. 1 can be ruled out. There is no impervious strata underlying the soil in this region. In fact a very porous disintergrating rock locally known as "garusu" underlies the soil and the results of experiments conducted on the soils for the past decade have shown that this "garusu" is easily permeable. The results of irrigation experiments indicate that the salts even when present in excessive amounts are washed down and there is no formation of perched water table or rise of salts to the surface. Since the irrigation project under construction will shortly supply water for growing garden crops the fear of development of alkalinity by heavy and indiscriminate irrigation is unfounded. The results of irrigation experiments show that light irrigation i. e. 2 inches of water supplied once in 15 days is found to be most suitable for the project area in general. However, heavy irrigation similar to wetland conditions can be advocated in restricted areas where very good drainage facilities exist.

growing green manure crops and ploughing them in situ will not only increase the soil fertility but also improve the drainage with the result that alkalinity is not likely to develop.

3. **The Grasshopper menace to Cotton: Remedy suggested:** The Cotton Grasshopper considered as a minor pest on cotton has been observed of late to cause considerable loss to the growers. During March, 1952, immediately after the sowing of the summer "Uganda" Cotton in Srivilliputtur Taluk of Ramanathapuram District under irrigated conditions, a large number of reports of damage to young seedlings by the Grasshopper was received. The insects damaged the terminal bud of the young seedling. The damage was however, observed to be less in plants grown to a height of 6 to 8 inches. The Grasshopper was found to harbour in the green grass and other weeds found on the buds. A trial dusting with Gamaxene D. 120 was found to be very effective in checking this pest and protecting the young seedlings. Field bunds should also be treated. About 15 lb. dust is required for an acre.

4. **The "Early Shoot Borer" on Sugarcane:** Estimation of loss in yield of cane due to the "Early shoot borer" was made at Anakapally during 1950—1951 season. During the first three months of the crop, about 35·0% of the total shoots withered. The loos in tonnage at the harvest was about 27·0%. Very few shoots that emerged during the fifth month of the crop matured into canes.

It is, therefore, clear that the borer is responsible for the loss of a large number of mother shoots and tillers which emerge early during the season. Hence, it is very necessary to protect the mother shoots and tillers that emerge during the first two months from the "early shoot borer" to get higher tonnage at harvest.

Planting a variety which tillers early and well, spraying 0·25% D. D. T. during 4th, 6th and 9th week of the Crop and earthing up to cover basal portion of young shoots during the early stages of the crop were tested and found to minimise loss due to early shoot borer.

5. **A Promising Lemon for the Hills :** Although some varieties of lemons are found to be in cultivation on the hills, experience has shown that it is difficult to secure a promising lemon variety combining both quality and yield. A few lemon varieties were tried at the Pomological Station, Coonoor situated at an elevation of 5600 to 5900 feet above sea level. Our trails at this station have shown that Sevillo lemon, a variety yielding fruits of oblong shape, fairly large in size, weighing on an average 4½ ounces per fruit, very nearly seedless and having fair to good juice content has performed well enough to deserve a recommendation for extended cultivation. The layered plants of this fruit attain bearing age in about 3 years and yield a mean crop of 45 fruits per tree per season in the initial years of cropping. The tree maintains a quick growth and presents a handsome appearance. It is suitable both for backyard and orchard cultivation in the Nilgiris and such other similar hill stations.

6. **Co. 25 Paddy Strain in the Tirunelveli District :** This Co. 25 Strain of paddy is locally known as Ponnuruvi (பொன்னுருவி) in certain places and Kattakola-valai (கட்டகொல்லவாழை) in the Tenkasi Taluk of this district. It is being cultivated on a large scale in the taluks of Tirunelveli, Ambasmudram and Tenkasi; Srivaikuntam, Nanguneri and Tiruchendur Taluks. In all the places where this strain is cultivated, the yield has never been lower than 3625 lbs. per acre under normal cultivation and manuring. It has given a highest yield of 6003 lbs. clean grain per acre.

The strain comes up well even when planted in November and responds very well to heavy manuring. It does not lodge except under cyclonic conditions. The yield of straw is equally very good though a little coarse in quality.

7. **The occurrence and control of the black bug of paddy (Scotionphora lurdia) :** During the last three years this insect was reported from Salem, Chingleput, South Arcot and North Arcot districts as attacking paddy crop and causing serious damage. The pest seems to be indigenous to certain areas in Chingleput district and from there appears spreading to other districts.

The insects are small sized, dull black in colour, emitting a buggy odour when handled. They will be visible only during the early mornings or late in the evenings. The insects are found on paddy in all stages of growth, from the nursery to the nature one, sucking the leaves and stems. In severe cases of infestation the emergence of ear heads will be affected and these will show a number of white empty grains. The insect may cause from anything from 25% damage to complete loss of the crop.

During the last season considerable areas have been treated in Chingleput, North and South Arcot districts. The insects are killed by 10% BHC, while DDT has practically no action on it. The thoroughness of application of the chemical is the main factor in obtaining success. In a grown up paddy crop where the insects remain at the basal portion, it is almost impossible to cover them with insecticides by any method. Therefore, treatment should be resorted to in the earlier stages of the crop growth, though at that stage no damage may be apperent. Another important factor for success is that an infested area should be tackled as one unit as part treatment of the area serves only as a temporary relief. For complete success, the treatment should be repeated a second time after an interval of 7 to 10 days.

8. **Laxmi Cotton in Royalaseema :** "Laxmi" is a variety of American cotton evolved in Bombay State. Trials of this variety at the Agricultural Research Station, Siruguppa and on farmers' holdings in the districts of Kurnool, Bellary,

Anantapur and Cuddapah under irrigated and rainfed conditions have given very encouraging results during the past two seasons which were very adverse for cotton. The mean yields under rainfed and irrigated conditions were 292 lbs. and 752 lbs. of seed cotton per acre respectively.

Such encouraging performance of the new cotton on cultivations' lands has made the cotton quite popular with the ryots and created a keen demand for the seeds of this new variety. The Bellary Co-operative Society imported 400 bags of Laxmi seeds and 4,000 acres are reported to have been grown during 1951—1952. The staple length, and ginning and spinning value of this cotton are 29/32″, 36% and 38 counts as compared to 24/32″ length, 30% and 24 counts for Westerns, the local cotton.

Should further trails confirm the previous results, the variety has a good future in this State, especialy, in Rayalaseema.

By growing this variety, the ryots stand to gain on an average Rs. 70 per acre under rainfed, and Rs. 175 per acre under irrigated conditions.

9. **Cotton Mixture with groundnut:** In Guntur District, groundnut, is grown over an extent of 70 to 100 thousand acres. If this area could be brought under mixed cropping with cotton, an additional output of 5 to 10 thousand bales of cotton could be obtained which wood go a long way to ease the cotton shortage. The experiments conducted on ryots fields at Narasaraopet showed that a net profit of Rs. 80 to 100 per acre could be obtained by the ryots by growing cotton "197–3" in the proportion of eight lines of groundnut to one of cotton as mixture.

10. **Cotton—Chilli Mixture:** The problem of finding a cotton variety suitable for growing as a mixture with chillies is not so simple as mixture with groundnut. Generally, the chilli crop is raised between August and September and harvested by the middle of February. The Cocanadas cotton "C. 1 or 336 B." will noted finish its harvest before the end of April. As such, these are grown as a mixture with chillies. They have to be protected against cattle tresspass for nearly two months after the harvest of the chillies. Hence the ryots are not eager to grow cotton as a mixture with chillies. At Narasaraopet and at the Agricultural Research Station, Lam, experiments are being conducted to obtain a suitable type of cotton which will complete its harvest along with chillies. Indications are that American varieties such as P. 216 F.(a) and Lakshmi cotton being early, minturation will be suitable for growing as a mixture with chillies. It has also been observed that the Madhya Pradesh Cotton variety H. 420 may be suitable to be raised as a mixture either with chillies or with goundnut. If cotton—chillie mixture becomes successful, an increase in the output of cotton from Kistna, Guntur and Godavari Districts is estimated at 80 to 100 thousand bales per year.

11. **A Quick Growing Fuel Tree:** 'Prosopis Juliflora' is capable of growing in all kinds of soils and conditions. Once the seeds germinate the tender plants normally withstand drought conditions. The plants are not touched by cattle, sheep and goats due to the presence of innumerable stiff thorns. This is a definite advantage since this plant can be grown without any special attention in waste-lands. In about five years they grow to a size fit for cutting. Further the pods are useful as cattle food.

This plant may be recommended for raising fuel plantations in all waste-lands, foreshores of tanks, road margin etc.

This tree also acts as a very effective hedge plant if shown close.

12. **Glyricidia Maculata H. B. a Good Source of Nectar:** This is one of the quick growing perennial shrubs, the cultivation of which is being actively popularised by the Department for the sake of supply of green leaves to be used as manure. The flowers of this shrub are freely visited by honey bees for nectar. The flowering commences by December and continues upto March. The actual bossoming takes place during the afternoons between 3 and 5 P. M. and the flowers remain open for about three or four days. The freshly opened flowers generally contain little or no nectar on the first day, but appear to secrete appreciable quantities on the subsequent days and bees, by virtue of their selective capacity favour only such flowers which contain this sweet fluid. Though the time of visit extends practically throughout the day, the maximum acting of her occurs between 10 and 11 and 12 noon. The honey collected from this source is red yellow in colour with an agreeable taste and a mild aroma.

13. **MOCO — Fit for Hand Spinning:** MOCO is the best type of perennial cotton and it serves the needs of individual families for hand spinning. It is early in flowering and gives a maximum yield of 1 Lb. of 'Kapas' in one picking per plant. One month aged seedlings may be planted on ridges at 5′ apart with a spacing of 4′ between the plants. It requires pruning in the month of June. Moco is best suited for growing in the backyards of houses.

14. **A Word to the Chilli Cultivators on the West Coast:** The cultivation of the chilli crop as a successful rainfed crop in rotation with the 'modan' (dry) paddy in Chirakkal and other Taluks of Malabar district has established itself as a result of the demonstrations conducted at the Agricultural Research Station, Taliparamba, during the past few years. The following are the advantages :—

(i) The crop can be cultivated from May to December-January purely as a rainfed crop in the tract without any expenditure on irrigation.

(ii) The crop is free from the ravages of wild animals and can therefore, be cultivated even in jungle areas of the hill slopes without fear of attack from wild animals.

(iii) The market rates are attractive.

(iv) The residual effect of the heavy manuring and the clean cultivation given to the chilli crop help to give a very heavy yield to the succeeding 'modan' paddy crop.

(v) The crop can be cultivated profiably in places with limited soil depth.

The area under chillies on the West Coast has increased by at least 45% during the past decade in Chirakkal Taluk alone.

15. **Reclamation of Alkali Lands in Cauvery-Mettur Project:** There are hundreds of acres of alkali lands in the Cauvery-Mettur Project area awaiting reclamation. These lands having the benefit of an assured supply of irrigation water of good quality may be made to grow good crops once reclamation is effected. The soils are sandy loam and poor in essential plant food elements. The soils contain soda clay with high alkalinity and low salt content. The drainage is very poor. The degree of alkalisation is very high.

Experiments were started in 1948-49 at Seethambalpuram for finding out the best method of reclamation of these alkaline soils. The treatment consisted in letting in water and draining it off repeatedly after which 5,000 Lb. of daincha was applied as basal dressing. The ameliorants tried were gypsum, lime and molasses with green leaf alone and in combination.

In the first year the results were in favour of molasses and green manure applied individually and in combinations namely molasses plus lime, gypsum plus green manure and lime plus green manure. Gypsum by itself was not beneficial.

In the second year of trials also it was found that gypsum alone was not effective in bringing down the pH. Gypsum plus green leaf gave erratic results. It was, however, found that a thorough reclamation is possible with green leaf at 5,000 to 7,500 Lb. or molasses 2½ to 5 tons or gypsum 2½ tons plus green leaf 5,000 lb. per acre. In general, the indications are that the application of gypsum in combination with green leaf or molasses and leaching out the salts appear to be the best method of reclamation of alkaline soils.

The trails on a bulk scale with S. R. 26 B saline resistant, paddy strain proved to be very effective. The area under this variety is fast increasing. It is expected that by cropping the field with this variety continuously in three years the salinity is expected to be reduced or removed.

16. **Use of Ammonium Sulphate to Jonna Crop under Rainfed Conditions in the Black Soils of Nandyal:** In the black soils of the Agricultural Research Station, Nandyal, ammonium sulphate at 80 pounds per acre was applied to Jonna crop over a basal dressing of Farm yard manure at five cart loads rate, during 1950–51 and 1951–52 seasons. Ammonium sulphate was applied to the soil by broadcast just before drilling jonna seed by about the middle of September. It is interesting to note the response of jonna crop to ammonium sulphate application. The Jonna crop in both the seasons was robust in growth and dark green in colour from the seedling stage. The plants were free from insect attacks. Prior to 1950, the average acre yield of jonna grain in N. 1. jonna at the Agricultural Research Station, Nandyal was 550 pounds without the application of ammonium sulphate. During 1950–51 and 1951–52, at the Agricultural Research Station, Nandyal, 12·68 acres and 14·51 acres respectively were grown with N. 1. jonna receiving the application of ammonium sulphate at 80 lb. dose over a basal dressing of five cart-loads of Farm yard manure per acre. An average acre yield of 675 pounds and 758 pounds of N. 1. jonna grain were obtained respectively in these two seasons in spite of the adverse seasonal conditions.

Gleanings

India produced a record quantity of sugar during the season just closed and attained the target of 15 lakhs tons fixed by the Planning Commission for the year 1955. Of this quantity, more than half was produced by Uttar Pradesh alone.

World production of cane and beet sugar reached a new record high in 1951—1952, reports the U. S. Department of Agriculture. Countries of the world grew an estimated 34,757, 500 metric tons, four percent more than the output of 1950—1951. India is one of the chief sugar producing countries of the world.

(The Farmer—October, 1952)

College Notes and News

INTERNATIONAL TRAINING CENTRE ON SOIL FERTILITY, COIMBATORE

The food and Agricultural Organization of the United Nations resolved, at their meeting in May 1952 at Bandung, to start an Inter-national Training Centre on Soil Fertility in the Agricultural Research Institute, Coimbatore. The main objective of this venture was to impart the cream of knowledge on soil-crop relationships, with special reference to paddy to the workers on paddy.

The Training Centre was inaugurated on 15th July 1952 by Sri Nityanand Kanungo, Member of Parliament. The inauguration ceremony was well attended by officers of the Government of Madras and the General public. Dr. H. G. Dion, who represented the Food and Agriculture Organization, Rome, gave a brief but clear account of the history, aims and objectives of the Training Centre at the inauguration. The classes started on the next day with the Director of the Training Centre Sri P. D. Karunakar, giving an introduction to the subjects that were to be taught to the trainees. Dr. J. G. Vermaat acted as the Associate Director, for the duration of the course. Ninteen trainees were deputed for this centre, from seven foreign countries, two each from Thailand and Vietnam, one each from Ceylon, Pakistan, Indonesia and the Philippines and eleven from India, viz., one from W. Bengal, two from Bombay, one each from Mysore, Hyderabad and Travancore Cochin State, Coorg and three from Madras State. All the trainees were accomodated in the Agricultural College Hostel, where a special canteen was established, providing them with food equivalent to international standards. A special feature was that both the trainees and the lecturers, including the Associate Director, Dr. Vermaat, had their board all together, facilitating healthy social contacts between the trainees and the lecturers.

The lecturers were drawn from those actually engaged as workers in soil science. Dr. R. L. Pendleton, a well-known authority on tropical soils started with a series of lectures on tropical rice soils. Dr. Shingo Mitsui, of the Tokyo University delivered lectures on Plant Nutrition and Soil Chemistry. Besides these experts from foreign countries, the following distinguished Indian specialists also delivered courses of lectures. Dr. V. G. Panse, Statistical Adviser to the Government of India and Dr. V. N. Amble, Statistician, Indian Council of Agricultural Research lectured on statistics. Dr. J. K. Basu, Soil Physicist to the Government of Bombay, dealt briefly with Soil Surveys and Soil Physics. Sri B. M. Lakshmipathy, Joint Director of Agriculture, Government of Madras, lectured on World Survey of Fertilisers Supply and distribution, as well as on the machinery used in Rice Cultivation. Dr. H. N. Mukherjee, Agricultural Chemist, Bihar, gave an account of the influence of fertilisers on rice crop and this was followed by Sri P. D. Karunakar's lectures on inorganic manures, organic and green manuring. Sri M. B. V. Narasinga Rao, Paddy Specialist, dealt with certain cultural aspects of rice growing. Dr. Raychoudri, lectured to the trainees on soil analytical methods and Dr. L. A. Ramdas on agricultural meterology with emphasis on crop weather conditions. Dr. Vermaat reviewed the latest methods on rapid methods of soil analysis, and also problems of soil erosion.

In addition to these lectures, the trainees were given opportunities of learning all the practical aspects relating to soil Fertility in practical demonstrations of field operations and analytical work. The trainees were also taken round to selected Research Station like Aduthurai and Nanjanad as well as to various other places of interest in and around Coimbatore, with the object of showing them

the different kinds of soils and methods of rice cultivation followed in the surrounding localities and also to give them an idea of South India and its people. No effort was spared to make the three months course an enjoyable one for all the trainees. One of their most enjoyable picnics was in Ootacamund, 7000 ft. above sea level on the Nilgiris, where they had a view of the magnificient scenery and wonderful mediteranean climate of the Nilgiris.

The Course came to a successful conclusion on October 15th with a farewell Dinner which was attended by the elite of the town as well as the members of the Research Institute who had assisted in the running of the Training Centre, and the trainees all dispersed to their various countries. It is a matter for legitimate pride that India was chosen as the venue of this the First International Training Centre on Soil Fertility and the Agricultural Research Institute at Coimbatore has cause for being singled out as the training centre.

CLUB DAY

1. The members of the Officers' Club celebrated their annual 'Club Day' with the usual eclat and grandeur.

2. The President and members of the Ladies' Club organised and staged an entertainment, which was of a high standard in providing mirth and laughter. The international trainees of the F. A. O. Course had an occasion to have an idea of the histrionic talents of the members of the Ladies Club.

3. The students joined the College after their Michaelmas Vacation.

4. **Agricultural Upper Subordinates Association, Coimbatore :** At the general body meeting held on 9—9—1952, the following were elected as office bearers for the year 1952—1953 :

1.	Sri.	K. Kuppamuthu	.. President
2.	,,	N. Ranganathachari	.. Secretary
3.	,,	D. M. Samuel	.. Treasurer
4.	,,	K. Meenakshisundaram	.. Members
5.	,,	S. Varisai Mohamed	

Nearly fifty per cent of the Upper Subordinates in the Madras Agricultural Department have not yet become members of the Association. As this association is the only official organisation, with the help of which they can better their conditions of service, they are requested to enroll themselves as members of the association without any further hesitation. By paying Rupees five and annas eight (Rs. 5—8—0) one becomes a life member of tho association.

Departmental Notifications.

GAZETTED SERVICE

Name of Officers	From	To
Sri M. R. Balakrishnan	Technical Assistant, through the Director of Soil Fertility Training Centre (Food and Agrl. Organization), Coimbatore	Lecturer in Chemistry Agricultural College, Bapatla
,, N. V. Kalyanasundaram	Sugarcane Inspector, Pugalur	Addl. Dist. Agricultural Officer (Manuring Scheme Eluru

Name of Officers	From	To
Sri Katchapeaswaran, S. S.	On leave	Dy. Director of Agriculture, Coimbatore
,, Venkateswara Iyer, P. A.	Dy. Director of Agriculture, Coimbatore	Lecturer in Agriculture, Agricultural College, Coimbatore
,, Muthuswami Iyer, S.	Sugarcane Inspector, Madurai	Dist. Agri. Officer, Cuddalore, S. Arcot. Dt.
,, Ramadas, A.	Dist. Agri. Officer, Cuddalore	Asst. Marketing Officer, Coimbatore
,, Raman Moosad, C.	Asst. Marketing Officer, Coimbatore	Superintendent, Central Farm, Coimbatore
,, Albuquerquo, S. D. S.	Asst. Oil Seeds Specialist, Coimbatore	Coconut development Officer, under the Andamans Administration
,, Krishna Rao, P.	Millet Specialist, Coimbatore	Vice-Principal, Agricultural College and Research Institute, Coimbatore, in addition to his own duties
,, Thomas, K. C.	Addl. Dist. Agricultural (Manuring Scheme) Vijayawada	In full additional charge of the post of Secretary, Krishna District Tobacco and Groundnut Market Committee, Vijayawada
,, Narasimha Rao, M. P.	Secretary, Krishna Dist. Tobacco and Groundnut Market Committee, Vijayawada	Asst. Research Officer, Agri. Research Station, Lam

POSTINGS AND TRANSFERS

Name af Officers	From	To
Sri Madhava Rao, T.	Addl. A. D. Gudivada	P. P. A. Ento. Vijayyawada
,, Vasudeva Menon, K.	Soil Survey Asst.	Asst. In chemistry Main Section, Coimbatore
,, Samuel, D. M.	,,	,,
,, Sriramamurthy, G.	Asst. in Chemistry Coimbatore	Asst. in Ento, Coimbatore
,, Shiva Rao, Y.	Asst. in Chemistry Coimbatore	Asst. in Myco, Coimbatore
,, Balaramulu, K.	Asst. in Chemistry Coimbatore	Adl. A. D. Nandikotkur
Sri Koteswara Rao, S.	Asst. in Chemistry Coimbatore	A. D. Guddalore
,, Sudarsana Rao, A.	Asst. in Chemistry Coimbatore	A. D. Chodavaram
,, Kumaraswamy, P.	Cotton Asst. Bellary	Adl. A. D. Chittoor
,, Padmanabha Rao, T. R.	Botany Asst. Singampatti	Spl. A. D. Cotton, Kodambur
,, Raman, N. V.	Ento. Asst. Coffee Borer Scheme, Ooty	Junior Ento-Myco Asst. Tindivanam
,, Ramakrishna Pramahamsa, B.	Cotton Asst. Lam Guntur	P. P. A. Ento. Guntur.
,, Krishna Alwa, H.	Oil Seeds Asst. Nileshwar	P. P. A. Myco., Mangalore

Name of Officers	From	To
Sri Ranganathan, K. S.	Millet Asst. Coimbatore	Adl. A. D. Coimbatore
,, Paramanandam, P.	Cotton Asst. Coimbatore	Spl. A. D. Sugarcane, Ariyalur
,, Kannan, S.	Asst. in Chemistry, Coimbatore	A. D. Pattukottai
,, Ravikumar, V.	Field Asst. in Chemistry Tanjore	A. D. Peravurni
,, Narasimha Dutt, K. V. L.	Fruit Asst. Kodur	Asst. in Paddy Maruteru
,, Venkateswara Rao, M.	Adl. A. D. Demons, Chittoor	Asst. in Paddy, Tirurkuppam
,, Srinivasa Rao, S.	Millet Asst. Tirupatur	Asst. in Paddy, Palur
,, Anantha Rao, K.	Millet Asst. Narasapatam	Asst. in Paddy, Coimbatore
,, Narasimha Rao, T. L.	A. D. Chodavaram	Asst. in Cotton, Nandyal
,, Venkateswaran, A. N.	Oil Seeds Asst. Coimbatore	Oil Seeds Asst. Nileshwar
,, Kumari Samthuvam, K.	Asst. in Chemistry Coimbatore	Asst. in Oil seeds, Coimbatore
,, Balasubramanam, V	Field Asst. in Chemistry, Mayavaram	Coconut Nursery Asst. Pattambi
,, Suryanarayanan, N.	A. D. Giddalore	Asst. in Oil Seeds Nileshwar
,, Ramachandran, M.	Junior Ento-Myco. Tindivanam	Asst. in Oil Seeds Tindivanam
,, Soloman Durairajan,	Adl. A. D. Kanchipuram	Asst. in Botany Cardamom Scheme Singampatti
,, Kumari Vinodhini Vasudevan,	Asst. in Chemistry Coimbatore	Asst. in Plant Physiology Coimbatore
,, Hanumantha Rao, P.	Myco. Asst. Coimbatore	Asst. in Physiology Anakapalli
,, Kalyanasundaram, N. V.	Sugarcane Inspector, Pugalur	Adl. D. A. O. (Manuring scheme) Eluru
,, Gopalakrishnan, P.	A. D. Tenkasi	Spl. A. D. Cotton, Sattur South
,, Annaswamy Iyer, S.	Spl. A. D. Cotton Sattur South	Seed Development Asst. (Paddy) Tirunelveli
,, Ramanatha Rao,	6. B. Warren Road, Mylapore, Madras, 4.	Statistical Asst. in Mycology, Coimbatore

SUBORDINATE SERVICE

Leave

Name of Officers	From	To
Sri P. S. Viswanathan	Spl. A. D., Melur	Granted leave for 30 days.
,, P. K. Sivasubramaniam	A. D., Pattukottai	Granted leave for 38 days from the date of relief
,, S. Periasamy	Asst. in Oil Seeds-Zonal Nocleus Seed Farm, Tindivanam	Earned leave for 30 days from 6—10—'52
,, N. Annaswamy	Seed Dev. Asst., Madurai	Granted Extension of Leave on average pay for one month from 13—9—'52 to 12—10—'52